

Date: Sat, 18 Jun 94 04:30:17 PDT  
From: Ham-Ant Mailing List and Newsgroup <ham-ant@ucsd.edu>  
Errors-To: Ham-Ant-Errors@UCSD.Edu  
Reply-To: Ham-Ant@UCSD.Edu  
Precedence: Bulk  
Subject: Ham-Ant Digest V94 #192  
To: Ham-Ant

Ham-Ant Digest

Sat, 18 Jun 94

Volume 94 : Issue 192

## Today's Topics:

AM/FM Antenna Splitting  
Antenna Design Resources  
enna radiation pattern charts  
Antenna Tuning Question  
Best Mobile Auto-Tuner?  
Long Wire question  
Newbie needs antenna  
Super J antenna (2 msgs)

Wanted -- Cheap, easy directional antenna ideas for 2m \*reception\* (2 msgs)  
What is feedpoint impedance of 1/2 wave vertical?

Send Replies or notes for publication to: <Ham-Ant@UCSD.Edu>  
Send subscription requests to: <Ham-Ant-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Ant Digest are available  
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-ant".

We trust that readers are intelligent enough to realize that all text herein consists of personal comments and does not represent the official policies or positions of any party. Your mileage may vary. So there.

Date: Fri, 17 Jun 1994 17:48:31 GMT  
From: ihnp4.ucsd.edu!swrinde!gatech!newsxfer.itd.umich.edu!news1.oakland.edu!  
rcsuna.gmr.com!kocrv01!jcbach@network.ucsd.edu  
Subject: AM/FM Antenna Splitting  
To: ham-ant@ucsd.edu

In article <Pine.3.05.9406151031.C1863-a100000@stargate>, rdixon@stargate.acs.ohio-state.edu (Bob Dixon) writes:  
> I use an automotive AM/FM radio in my shack for general listening, because  
> it runs off 12vdc which I use for all the radios. The problem with auto  
> radios is they use the same antenna for both AM and FM. An auto whip doesn't  
> work at all well in the shack (basement, no ground plane, etc). I tried one

> of those amplified AM/FM antennas from Brookstone (also available elsewhere)  
> and it was worthless. So I want to use REAL AM and FM antennas, outdoors etc.  
> But the problem is how does one connect them both to the same antenna  
> jack? Are there tuned splitters available for this purpose? I have looked at  
> the schematic of the radio, and it appears the two front ends are just  
> connected together, so I suppose I could tear into the radio and separate  
> them, but would rather not. Has anyone solved this problem, or have suggestions?  
>  
>  
>  
>  
Bob W8ERD  
>  
>

MY guess would be that you can just hang the biggest piece of wire you can afford (space-wise) and connect it to a single piece of coax to run back to shack.

One thing that you might try, is hang a large piece of wire for the AM band and "Tee"-in the coax from a 1/4-wave FM antenna (28" element, like most car whips). You should be able to use a single feedline into your car AM/FM radio, and you should be able to "Tee" together two different antennas at the other end.

The principle here is the same as a multi-wire HF antenna, where several 1/2-wave dipoles, each "cut" for a different band, are tied to a common coax feedpoint. The one on my roof works VERY well. No funky matching/splitting network need apply. The RF will come/go thru the lowest impedance path, which will be the antenna which is "resonant" at that frequency.

BTW . . .

I opened-up one of those 300-Ohm VHF&FM to 75-Ohm "splitters" once, and it was nothing more than a small-ferrite transformer to convert the 300-to-75 Ohms, and the 2 300-Ohm terminal pairs were simply electrical "duals" (i.e. "tee"), and EITHER could be used for VHF or FM.

--  
James C. Bach                    Ph: (317)-451-0455                    The views & opinions expressed  
Advanced Project Engr.        GM-NET: 8-322-0455                    herein are mine alone, and are  
Circuits Bldg Blocks Grp      Amateur Radio: WY9F                    NOT endorsed, sponsored, nor  
Delco Electronics Corp.       Just say NO to UNIX!                    encouraged by DE or GM.

---

Date: Fri, 17 Jun 1994 14:54:15 GMT  
From: ihnp4.ucsd.edu!agate!boulder!csn!news.den.mmc.com!news2!NewsWatcher!  
user@network.ucsd.edu  
Subject: Antenna Design Resources  
To: ham-ant@ucsd.edu

Does anyone know of an FTP site or the like with antenna design guidelines/notes/papers? I am interested to some extent in amateur radio but also designs such as bifilars, slots, patches, etc. Basically, I need up-to-date information if it's available on the net.

-Al  
toro@den.mmc.com

---

Date: Fri, 17 Jun 1994 14:02:31 GMT  
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!sundog.tiac.net!  
usenet.elf.com!rpi!psinntp!arrl.org!jbloom@network.ucsd.edu  
Subject: Antenna radiation pattern charts  
To: ham-ant@ucsd.edu

Jim Bromley, W5GYJ (jbromley@sedona.intel.com) wrote:  
: After an exhaustive literature search, I have found that directionality  
: is the property that antennas exhibit of having their main pattern  
: lobes where the DX isn't.

A literature search? That's odd...most people discover this principle empirically. :-)

--  
Jon Bloom KE3Z jbloom@arrl.org

---

Date: Tue, 14 Jun 94 08:01:58 MST  
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!gatech!newsxfer.itd.umich.edu!  
jobone!lynx.unm.edu!dns1.NMSU.Edu!usenet@network.ucsd.edu  
Subject: Antenna Tuning Question  
To: ham-ant@ucsd.edu

On 10 Jun 1994 22:00:02 -0400,  
NX7U <nx7u@aol.com> wrote:

>In article <jyoungberg.6.000DB1A8@draper.com>, jyoungberg@draper.com  
(James W. Youngberg) writes:  
>  
>>Any thoughts on tuning up yagis at nominal ground level by aiming  
>them up?  
>  
>Just a thought...a technique that Butternut uses with that HF5B  
>"Butterfly" beam and seems fairly sound.  
>If you can model ground effectively ("choose your own computer  
>weapon"), and you believe 100% in the accuracy of modelling, then why

>not proceed from an incremental approach?  
>In other words, design the antenna on the computer for whatever  
>height you want to mount it at. Then, model it again where you'll  
>build it (probably horizontal, about 4 feet off the ground or so).  
>Obviously the impedance vs. frequency characteristic will change; in  
>particular, the yagi self-resonance frequency will change for each  
>band.

>Use that "near-to-ground" result as the target to actually tune the  
>antenna up. Small deviations in element spacing and element length  
>(the process of tuning up the antenna) shouldn't drastically change  
>the elevated performance.

>Any comments?

>scott nx7u@aol.com

>

Scott: You principles are good, but in practice the accuracy of modelling programs for antennas very near the ground is not good for several reasons. First the type of ground you are very near to is not well known unless you have measured the ground parameters at your location and secondly the number of current samples (pulses in mininec) you have to take to model the interaction of conductors at very close spacings (antenna and ground) is very high making the program slow if it can be run at all and this also lessens the accuracy due to additional roundoff noise in the computer. Again very good idea just not too practical with todays tools come back in a few years hihi.

William Osborne, AA5ZQ                505-646-3919  
Professor ECE Dept.                PO BOX 30001, Dept. 3-0  
New Mexico State University        Las Cruces, NM 88003-0001

-----

Date: 17 Jun 1994 19:40:23 GMT  
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!gatech!newsxfer.itd.umich.edu!  
zip.eecs.umich.edu!yeshua.marcam.com!news.kei.com!ssd.intel.com!chnews!  
cmoore@network.ucsd.edu  
Subject: Best Mobile Auto-Tuner?  
To: ham-ant@ucsd.edu

I want to obtain an automatic antenna tuner for mobile work. Any recommendations?... comments?... experiences?

thanks in advance, 73, KG7BK, CecilMoore@delphi.com

-----

Date: Fri, 17 Jun 94 17:44:42 GMT  
From: ihnp4.ucsd.edu!swrinde!gatech!newsxfer.itd.umich.edu!zip.eecs.umich.edu!  
panix!198!mgalatz@network.ucsd.edu

Subject: Long Wire question  
To: ham-ant@ucsd.edu

I have some basic questions:

What guage wire should be used?  
Insulated?  
How long and how high?  
How do you feed it into the house?

-----

Date: 17 Jun 1994 17:54:59 GMT  
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!cs.utexas.edu!  
geraldo.cc.utexas.edu!smf-n13.facsmf.utexas.edu!HAL@network.ucsd.edu  
Subject: Newbie needs antenna  
To: ham-ant@ucsd.edu

When my grandfather passed away, he left me about 3 short-wave radios  
(they're pretty old...they are a Collins, Laffayette, and Allied)

I would like to use them but I don't really have an antenna. I have hooked up a CB antenna to the Allied and am able to receive a few (VERY few) stations on the 7 meter band. Can someone help me? Is there a way I can just string some wire up and receive some more stuff? I checked at Radio Shack and they had a short-wave antenna for \$40 but it seemed like it could be easily made. The other consideration is that I live in an apartment....but I do have access to a large yard and could hook up a larger antenna for short periods of time. Anyone willing to give me direction???? Ideas??? Books to read??

Thanks

Phillip

Hal@utxvms.cc.utexas.edu

-----

Date: Fri, 17 Jun 1994 21:52:28 GMT  
From: parc!biosci!netnews.synoptics.com!news@decwrl.dec.com  
Subject: Super J antenna  
To: ham-ant@ucsd.edu

I confess my ignorance of antenna theory. Why does the super j antenna need the phasing section to provide a low angle radiation pattern? Simply adding another 1/2 wave radiator will keep things in balance electrically, but how does the phasing section affect the angle of radiation?

Its a mystery to me.

Dave  
wa6qwl

-----

Date: 17 Jun 1994 23:36:52 GMT  
From: ihnp4.ucsd.edu!agate!kennish@network.ucsd.edu  
Subject: Super J antenna  
To: ham-ant@ucsd.edu

In article <CrKA3G.ADs@synoptics.com>,  
David Bashaw <dbashaw@synoptics.com> wrote:  
>I confess my ignorance of antenna theory. Why does the super j antenna need  
>the phasing section to provide a low angle radiation pattern? Simply adding  
>another 1/2 wave radiator will keep things in balance electrically, but how  
>does the phasing section affect the angle of radiation?  
>Its a mystery to me.  
>  
>Dave  
>wa6qwl  
>

I'm not sure what a super j antenna is, but it sounds like an end-fed antenna with half wave sections. what follows applies to most all collinear antennas made of 1/2 wave sections that are resonant:

a single 1/2 wave vertical section has a given antenna radiation pattern, omni in the horizontal plane with an effective angle of radiation of so many degrees (36 comes to mind, but don't quote me). adding another 1/2 wave radiator to the end will superimpose another equivalent radiation pattern, BUT, the signal going into it is delayed by 1/2 wave, and the point of origin is 1/2 wave away from the first section.

if you draw the current waveforms, you will note that they will tend to add in the vertical direction and cancel in the horizontal direction. the radiation is concentrated in a narrower angle, but the angle of radiation goes UP!

an extreme example of this is the infinite longwire ... (assume no reflection, or you could do this with a longwire with a matched load). if you look in an antenna book, you will note that the pattern is a pencil directly down the length of the wire, with none perpendicular to the wire. if this antenna is turned on end (as in a vertical), you make a great antenna to talk to the birds, but lousy for anything else.

now, consider the following: add a 1/2 wave delay element between

each 1/2 wave section -- takes no physical space (or very little) but inverts the phase of the signal. now look at the resulting pattern formed by superimposing the two patterns from each 1/2 wave section. you will note that the same thing happens, but the energy gets squashed in a plane perpendicular to the wire -- voila, power to the horizon where you want it.

in practice, 1/2 wave phasing sections are made from slow wave structures (helices) that take finite room, so there needs to be some simulation to get the phasing right. another method is the in/out coax antenna, where you swap inner and outer conductors of the coax each 1/2 wave, so that the outer current inverts each 1/2 wave section. (there was an excellent post on the construction of this antenna not too long ago.)

you get more gain by stacking these collinear sections, but the bigger you get, the nastier the bandwidth issues go. best to use an antenna simulator for anything over 5 sections.

-Ken

-----

Date: Fri, 17 Jun 94 09:56:57 -0500  
From: news.delphi.com!usenet@uunet.uu.net  
Subject: Wanted -- Cheap, easy directional antenna ideas for 2m \*reception  
To: ham-ant@ucsd.edu

Vinod Narayanan <vinod@watson.ibm.com> writes:

>Are there any simple antennas that I can build to enhance this  
>reception? The emphasis is on simple, like with twin-lead or something  
>like that. Note that this is only for receiving.

Vinod,

If it is only for rx, or not, try a quick 2M quad. use pvc for the boom, dowel spreaders, and you can use cheap copper for the elements. I can give you the dimensions from my max systems 3 element unit. the best part is that you can transmit with it. It is only \$35 new, and i believe that you could build it for \$10, especially if you have some parts around.

let me know if you want the dimensions.

73 de  
pete, n1qdq

-----

Date: 17 Jun 1994 12:40:21 GMT  
From: newsgate.watson.ibm.com!watnews.watson.ibm.com!vinod@uunet.uu.net  
Subject: Wanted -- Cheap, easy directional antenna ideas for 2m \*reception\*  
To: ham-ant@ucsd.edu

While tuning around yesterday, I realized that I can barely receive W1AW on my HT on 147.550; it barely manages to break the squelch. (Newington is probably about 40 miles straight-line).

Are there any simple antennas that I can build to enhance this reception? The emphasis is on simple, like with twin-lead or something like that. Note that this is only for receiving.

Any help appreciated, many thanks in advance.

--

--vinod  
email: vinod@watson.ibm.com

---

Date: 17 Jun 1994 16:40:12 GMT  
From: pa.dec.com!src.dec.com!crl.dec.com!nntp.lkg.dec.com!iamu.chi.dec.com!  
little@decwrl.dec.com  
Subject: Wanted -- Cheap, easy directional antenna ideas for 2m \*reception\*  
To: ham-ant@ucsd.edu

In article <2ts5jl\$fkj@watnews1.watson.ibm.com>, vinod@watson.ibm.com (Vinod Narayanan) writes:

|>While tuning around yesterday, I realized that I can barely  
|>receive W1AW on my HT on 147.550; it barely manages to break  
|>the squelch. (Newington is probably about 40 miles straight-line).  
|>  
|>Are there any simple antennas that I can build to enhance this  
|>reception? The emphasis is on simple, like with twin-lead or something  
|>like that. Note that this is only for receiving.

You don't mention what you're using now, so it is hard to say how much improvement you need. If you are currently using a rubber duck or similar dummy load, almost any real antenna will work. A 1/4 wave or 5/8 wave vertical would be easy to build and work well. Also the twin-lead J-Pole that is usually posted here several times a year will do the trick.

The major concern is getting some height. What you can't hear at 5 ft off the ground can be full quieting at 25 ft off the ground. Even if you have to put the antenna in an attic, or taped to a window, etc. The twinlead J-Pole taped to a second story window and run down to your HT with any reasonable coax will do fine. A vertical dipole in the attic would

also do the trick given the distance you want to work.

73 es gl,  
Todd  
N9MWB

PS Experiment! You'll learn a lot more by experimenting than by simply getting it to work.

---

Date: Fri, 17 Jun 1994 13:20:15 GMT  
From: ihnp4.ucsd.edu!usc!math.ohio-state.edu!hobbes.physics.uiowa.edu!  
newsfeed.ksu.ksu.edu!moe.ksu.ksu.edu!osuunx.ucc.okstate.edu!olesun!  
gcouger@network.ucsd.edu  
Subject: What is feedpoint impedance of 1/2 wave vertical?  
To: ham-ant@ucsd.edu

In article <2tqcf4\$pok@chnews.intel.com>,  
Cecil A. Moore -FT-~ <cmoore@ilx018.intel.com> wrote:  
>Gordon Couger (gcouger@olesun.okstate.edu) wrote:  
>  
>: BTY does any one know how to model an end fed antena with ELNEC?  
>: Gordon AB5DG  
>  
>What are you working against with your real world end-fed? i.e. to what  
>do you tie the coax shield or other wire in your transmission line?

Most I have seen tap in to a coil in a resonate tank. I am not sure  
how Cushcraft does it on the R5 & R7

Gordon

Gordon Couger  
Biosystems & Agricultural Engineering  
Oklahoma State University  
114 Ag Hall, Stillwater, OK 74074

gcouger@olesun.agen.okstate.edu 405-744-9763 day 624-2855 evenings  
I do not speak for my employer

---

Date: 18 Jun 1994 00:42:09 GMT  
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!uhog.mit.edu!  
news.kei.com!ssd.intel.com!chnews!scorpion.ch.intel.com!jbromley@network.ucsd.edu  
To: ham-ant@ucsd.edu

References <edh.771252569@hpuerca>, <2ta0tb\$lgb@ornews.intel.com>,  
<1994Jun17.173201.29854@kocrv01.delcoelect.com>

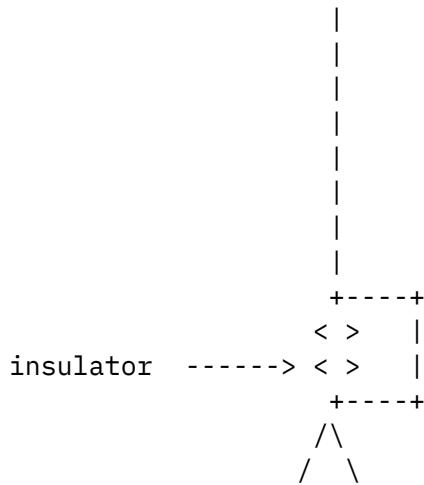
Subject : Re: Ringos and J-Poles (was: Newbie Continues Pondering J-Poles)

In article <1994Jun17.173201.29854@kocrsv01.delcoelect.com>,  
James C. Bach <jcbach@kocrsv01.delcoelect.com> wrote:

>I've been pondering if I couldn't "shrink" a j-pole by 33% by  
>using ladder-line (shorted at one end) to emulate the  
>twin-tubing parallel "matching section" of the copper-cactus?

>In other words, instead of wasting a 1/4-wavelength of my  
>vertical dimension with what is essentially a matching network  
>made of 2-conductor transmission line (with FAT conductors and  
>an air dielectric) could I replace it with a coiled-up  
>transmission line with thin conductors and foam dielectric?

No \*electrical\* reason why not. However, you lose one of the huge advantages of the J-Pole, it's all-metal construction. With your new arrangement, essentially a 1/2-wave vertical, you have to provide a load-bearing insulator at the base of the antenna. Kind of like so:



Jim, W5GYJ

---

Date: Fri, 17 Jun 1994 17:32:01 GMT  
From: ihnp4.ucsd.edu!swrinde!gatech!newsxfer.itd.umich.edu!news1.oakland.edu!  
rcsuna.gmr.com!kocrsv01!jcbach@network.ucsd.edu  
To: ham-ant@ucsd.edu

References <2t8jv7\$hgg@abyss.West.Sun.COM>, <edh.771252569@hpuerca>,  
<2ta0tb\$1gb@ornews.intel.com>

Subject : Re: Ringos and J-Poles (was: Newbie Continues Pondering J-Poles)

I've been pondering if I couldn't "shrink" a j-pole by 33% by using ladder-line (shorted at one end) to emulate the twin-tubing parallel "matching section" of the copper-cactus? In other words, instead of wasting a 1/4-wavelength of my vertical dimension with what is essentially a matching network made of 2-conductor transmission line (with FAT conductors and an air dielectric) could I replace it with a coiled-up transmission line with thin conductors and foam dielectric?

I've done some Zo calculations on several J-pole designs, and based on the element diameters and spacings it seems that Zo can range anywhere from about 150 to 600 Ohms, with most designs around 300-400 Ohms. Working out the impedance transformation calculations it becomes OBVIOUS that Zo doesn't matter much, so long as the end opposite the antenna is shorted, that the matching section is 1/4-wavelength long, and you can "move" the feedpoint for tuning purposes.

Doing this I could make a ground-mounted, radial-less 1/2 (or 5/8) wave vertical for 20M that is only 33ft (or 42ft) tall, rather than 50ft (or 59ft) tall.

Now, if I could ONLY convince my wife that she really NEEDs a 42ft flag pole :-)

--

James C. Bach                    Ph: (317)-451-0455            The views & opinions expressed  
Advanced Project Engr.        GM-NET: 8-322-0455            herein are mine alone, and are  
Circuits Bldg Blocks Grp      Amateur Radio: WY9F            NOT endorsed, sponsored, nor  
Delco Electronics Corp.       Just say NO to UNIX!            encouraged by DE or GM.

-----  
End of Ham-Ant Digest V94 #192

\*\*\*\*\*